

Providing Faculty iPods to Explore Innovative Teaching and Learning

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Abstract

The iPod digital music player has been available since late 2001, and even in higher education, its presence has been seen, although mostly in the hands of students and rarely for outcomes-based educational purposes. In 2004, Duke University provided free iPods to all 1,650 first year students, which subsequently enabled faculty to create learning opportunities, which actively engaged students to integrate digital audio and more into their lessons. Our study takes an alternate approach in which the Center for Teaching and Learning provided a small group of faculty ($n = 11$) from different disciplines with a free iPod, microphone, training, support and collaboration opportunities. The faculty members were asked to create innovative instructional methods and then use the tool in their classes for the 2008 spring semester. In return, faculty agreed to share their outcomes, which would become part of a resource showcase to assist other faculty. So, instead of distributing the technology to a wide audience, where only some may participate, and our goal was to identify those who would actively engage in the project, develop specific applications, and ultimately assist faculty and subsequently students, in integrating functional instructional technology. The primary purpose of this study is to share another model for using and distributing electronic media tools in higher education and secondarily to provide the results of this model in the form of varied and successful uses of the device in teaching and learning.

Keywords: iPod, active learning, instructional technology.

Educational technology has continued to gather attention due to its increase in use and potential to assist some students with learning styles aligned to the strengths of technology enabling them to participate more easily and to learn more effectively (Palmieri, 1997). There has been an increase in the types of instructional technology as well, including laptop computers, document cameras, digital cameras, presentation software, handheld computers and now a new approach to mobile/social technology which allows the user/student to become more actively engaged as a stakeholder and contributor. Terms such as Web 2.0 and AJAX (Asynchronous JavaScript and XML) are frequently used now, which is a perceived second generation of the web or a new way to use the web in a social construct. The line between learning and socializing is becoming fuzzier as students use the same tools for capturing and attending to both environments. Examples of this approach are blogs, wikis, podcasting, virtual worlds and a host of social networking categories. Students have integrated their cellular phones (with digital cam-

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era/video and audio); as well as iPod digital recorders/players into many aspects of their lives. One particular example of the ubiquity of digital capacity is during an environmental science course, to build context and relevance during class, the class was asked to walk through campus to visit trash dumpsters. The following week, the class was to meet at the local county landfill, so the intent was to provide students with an origin for the landfill material. When arriving at the dumpster, the instructor simply asked the students to document the area, preparing detailed notes, sketches and taking photographs. Without hesitation, every one of the twenty students took out their cellular phones and began taking digital photos; two even captured digital video on their phones. That evening, students downloaded their digital media to a discussion board thread located on the course Blackboard site to begin the collaboration of sharing information for their project-based research deliverable at the end of the term.

The concept of using handheld technology such as iPods extends beyond these specific tools. A philosophy of using small external devices to significantly increase the amount of time students are engaged, physically and mentally, has been shown in numerous learning environments. In working with chemistry students, Clark (2003) used handheld computers with sensors successfully; “we have a few more hurdles to overcome but the principle has been well demonstrated that the combination of sensing and handheld devices provides a good, worthwhile lab experience for our students.” The literature correlating the advantage of authentic, meaningful learning, especially when retention is of primary concern has been linked to hands-on learning, and using objects as it focuses on the learners’ curiosity. Curiosity plays a role by acting as both a response to a stimulus and a factor for influencing further attention. As Koran and Longino (1983) found, the greater the complexity of the object, the higher degree of curiosity it will evoke. They also compared the time spent as a measure of attention to time in the vicinity of the stimulus can be a measure of curiosity. Further, Koran and Koran (1984) demonstrated that curiosity is a response to a novel stimulus, such as objects found in informal settings, which in the case of this study would be working with the iPods in arena outside of formal educational uses.

There are now many iTunes universities which post audio/video material on their official iTunes for students and the general public to download and use. Other institutions which have or are using iPods in their teaching and learning include

- Stanford on iTunes U (<http://itunes.stanford.edu/>)
- Georgia College and State University iPod Course related projects (<http://ipod.gcsu.edu/Course-related/index.html>)
- Spring Arbor University research on iPods (<http://www.arbor.edu/news.aspx?id=30323>)
- University of Richmond mobile learning (<http://learning.richmond.edu/mobile/ipod.html>)

Although it seems apparent that digital tools are in the hands of students, the same uniform statement cannot be made for faculty members. There certainly are faculty members who are involved in using technology for personal and professional uses, however,

there seems to be a distinct disconnect on the crossover effect, which students have readily embraced. This philosophy allows people to carry technology equipment which can be used for multiple purposes – personal and professional. In this model, people, particularly students become very adept at manipulating the devices, initially due to intrinsic reasons – they want to take photos, download music, create video, etc. of their friends, and as such become experts at operating THEIR devices. Ownership is critical here, as the owner becomes an expert on their device and can quickly and efficiently capture and populate their digital library with their material, enabling a ready environment for which to capture scholarly material as well. Ownership typically reinforces one's ability to regulate use and function in a technology environment. The better people are at regulating their own learning, the higher their chances of success with technology (Hargis, 2000). Therefore this project was initiated to provide the technology, training, and support to encourage ownership, subsequently developing innovative teaching and learning techniques.

Process

Eleven iPod audio devices and associated microphones were purchased by the Center of Teaching and Learning and distributed to faculty members who expressed an interest in the initiative. The faculty met on two occasions as a group, were provided the basics on how to turn on, sync, download, subscribe to RSS feeds, record and download good audio, etc. Center staff demonstrated the process and provided several internet sites, which faculty members could refer to for assistance. The sites included

The Teachers Podcast (<http://www.teacherspodcast.org/podcasting-help/>);
Podcasting News (<http://www.podcastingnews.com/tag/educational-podcasting/>);
and, Podagogy (<http://blog.podagogy.com/?cat=9>).

They were then asked to develop and share their ideas on how they could use the teaching tool in their teaching and learning. Continued support was provided on an as-needed, one-on-one model from the Center staff, which turned out to be a marginal effort. Some of the technical assistant provided included additional training on how the microphone works and interfaces with the iPod; downloading and syncing the iPod with a computer; saving and moving files from the computer to the podcasting section of Blackboard; sharing of best practices for recording useable audio; and reminding of the copyright issues.

Results

Amongst the faculty who received iPods, were four from the Psychology department, who decided to work together, share iPods, ideas, collaborate, etc. We met initially to develop a plan (prepare, submit, and receive IRB approval), roles, timeline, format of writing and even drafted a consistent baseline evaluation instrument, which each would distribute to all students in order to request, receive and compile attitudinal data. Faculty asked students to report the extent to which they agreed with four statements on the iPod application using a 4-point scale (1= strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). Faculty adjusted questions slightly to fit with their specific iPod applica-

tion, but each faculty asked about whether they a) liked the application, b) found the application useful in developing skills, c) would be interested in similar applications in the current course, and d) would be interested in similar applications in other courses. Students were also asked to provide open ended comments, about what they liked most about the iPod application and how they thought it could be improved. The results from the surveys were positive for each faculty member and the data used to assist in improving the use of iPods in subsequent courses.

The four primary participating faculty members met prior to the study and developed four consistent prompts which they would use to gather data on their projects. The prompts included Challenge, which describes the scenario which they felt could be addressed with an iPod; Solution, which provided their idea of how to use the iPod to address the Challenge; Measures, or the data collected to determine the effectiveness of the iPod; and Outcomes, that summarized their evaluation of the projects.

Faculty #1

Challenge 1: Monitoring laboratories and discussion groups. Labs and small discussion groups for courses are often run by a teaching assistant (TA), and yet are an integral part of the course as a whole. Instructors may struggle how to monitor the lab activities, but cannot attend regularly, and do not want to usurp the teaching opportunity from the teaching assistant. The interactions with TA's are potentially rich environments for both the student and the TA's, therefore an opportunity to collect relatively unobtrusive data and act upon the data is a challenge.

Solution: I used the iPod with microphone to check in on a set of six discussion groups for an Introduction to Psychology course with 120 students. I sent the iPod with my graduate TA with the instructions to record several different parts of the discussion groups. During the groups, the students make presentations on the material, and engage in small group discussions.

Measures: From their recorded comments I noted that several were initially nervous when the iPod was turned on during their discussion, but they appeared to quickly habituate to the microphone being present.

Outcome: I was able to listen to parts of the discussions while working on other tasks. Since I did not have to pay full attention to the discussion, nor grade their performance in anyway, I found that I have been able to easily fit this listening into my schedule without taking very much extra time. Listening to the comments has given me a much better sense of how the groups are going and given me several ideas for feedback to share with the teaching assistant to improve the groups. Overall, I found this to be an efficient way to track the progress and goings on in the groups, without investing too much time in the process.

Challenge 2: Engaging students in a large lecture class. Large lecture classes often serve as a deterrent for students to ask more specific questions and to make comments. Stu-

dents often indicate they are nervous to ask a question or make a comment in a large group for fear of what the other students might think.

Solution: To decrease the concern over asking questions in front of a large group, I used the iPod and microphone to allow students to ask questions or make comments. At the end of each lecture, I would place the iPod and microphone on a desk at the front of the class and encourage students to “Ask the Professor” on the iPod. I would later listen to these questions and address them at the beginning of the next class.

Measures: Over the eight lectures during which the “Ask the Professor” system was used, a total of ten questions were collected. Only one question was asked the first time it was offered and no questions during the second or fourth use.

Outcome: While it seemed to take a few times of announcing this and making reference to it for it to catch on, there was a small increase in use over the final four lectures. Several students commented on their end of the semester evaluations that they appreciated this avenue for asking questions and recommended continuing to use it. I forgot a few times to start the following lecture with the questions that had been asked, and this may have led to a decreased interest in asking questions. There were more questions asked on the days that I started the class with a previous question. I also found that the nature of the questions asked were somewhat different, with students asking more personal questions about the professor or their own situation. Overall, I think this may be a useful way to include more students in the lecture process and discussion, but it does require consistency.

Faculty #2

Challenge 1: Interviewing Children. Textbooks on child development can provide a common experience for students, but often lack the power and richness of observing real children and adolescents. In contrast, field observations can provide moving and interesting examples of class concepts, but are often idiosyncratic from student to student, moment to moment. The purpose of the proposed activity is to provide students with a common observational resource for studying cognitive development in childhood, which can then be used in an assessment that is authentic while still consistent across many students.

Solution/Measures: This activity was conducted in a child development class with 50 students. After discussing two approaches to cognitive development (Piagetian theory and Information Processing theory), students generated questions that they expected would be answered differently by children of different ages. Students were encouraged to consider relevant concepts such as abstract thinking, memory, and problem-solving. Students were then given the full list of questions that they had come up with and were asked to vote for the ones they thought would best illustrate issues of cognitive development. Based on their votes, I selected the ten most popular questions. I then arranged interviews with a small sample of children and adolescents between the ages of five and 17. The children were diverse in terms of gender, ethnicity, and generational status. I asked each child the ten questions and recorded their responses onto the iPod. The recordings were

then edited and spliced together so that each question was followed by responses from several children. These audio clips were placed on the course website for students to listen to on their own time and were used as part of an extra credit assignment. Students were asked to choose responses that best illustrated the different principles of cognitive and language development to reason about children's relative age based on their responses.

Outcome: The students generated a wide range of questions, and the final set of questions elicited interesting and informative answers from the children who participated. Twenty-two students elected to complete the extra credit assignment. The students were creative in applying their understanding of cognitive development to children's responses, noting examples of egocentrism, abstract thinking, and overextension of morphological rules, problem solving, and more. Twenty of these students completed a survey evaluating the audio clips assignment. Ninety-five percent of students agreed or strongly agreed that they liked the assignment, and 100% agreed or strongly agreed that they liked listening to children's actual responses. Indeed, more than a third of the students indicated that what they liked most about the assignment was hearing real responses from actual children. One student wrote, "I actually got to hear how kids would respond to a question instead of reading about how they might respond." Students also indicated that they enjoyed generating their own questions, with 95% agreeing or strongly agreeing that they liked this part of the assignment.

Challenge 2: Recording Student Writing Conferences. Although written and spoken language has many functional similarities, there also exist differences in form, function, and development (Garton & Pratt, 1998). While conferencing with students on writing assignments, I find that sometimes unclear writing signals an incomplete conceptualization of the ideas, but at other times students seem able to express ideas clearly via speech. In these cases the ideas become less clear when they attempt to conform to the style and conventions of written language. In this application, I used the iPod to help a student bridge between her spoken and written language.

Solution/Measures: I was working with a student who was struggling to find her own words to describe an especially complex part of her paper. By both of our estimations, the section stood out as both unclear and jargon-laden. I asked her to put aside her paper and the source from which she was working and to simply describe to me the ideas she wanted to get across in this paragraph. When speaking aloud she was able to succinctly and clearly express the ideas that were difficult for her to express in writing. I recorded her explanation with the iPod while she spoke and then played it back for her to listen to. I also sent her an audio file of the exchange for her to use to revise her paper.

Outcome: I found this process to be quick and effective. Although there were minor grammatical issues in her spoken response, these issues were easily resolved while still retaining the clarity of her speech. The student was also pleased with the process: "I was having the hardest time taking an idea for my paper and putting it into my own words. I understood the concept, but as I word processed the paper any revision from the original source seemed to be very confusing and awkward, so that at the end, I was faced

with the possibility of just having to quote the whole section, something I really didn't want to do. My instructor suggested that I try and explain the idea in my own words out loud as we recorded my explanation with the iPod... A passage I had revised now maybe 3 or 4 times with no success and spent much time on, took me about three minutes to revise for the final time in my own coherent words. It worked out perfectly, and I ended up getting 100% on the paper! ... I think the iPod was a great way to help me to transform ideas from original sources into my own words and thoughts and also to confirm to myself that I really understood what I was writing about."

Faculty #3

Challenge: In larger classroom settings, providing detailed and informative feedback on paper assignments can be difficult. Ideally, students would have the opportunity to meet with the instructor one-on-one and discuss the strengths and weaknesses of their writing assignments. However, individual meetings can be difficult or impossible to arrange in larger classes because of the time required and the difficulty in coordinating the schedules of the instructor and students. In such circumstances, feedback typically is limited to written comments made on the assigned paper, or perhaps added to an electronic document. This can pose at least two problems (1) providing informative written feedback can be time-consuming for the instructor; and (2) written comments might be misunderstood or not understood by the student.

Solution: One way to address these problems is for the instructor to use the voice memo feature of an iPod to dictate comments about student papers as they grade them. In so doing, the instructor can explain any concerns they have about the writing and clarify what might otherwise be vague written commentary. After some initial practice, such dictation can prove easier and less time-consuming than written comments, and even result in a more comprehensive feedback package for the students. The audio file can then be provided to the students to access at their convenience. For the current project, I first read through each paper and made very minimal marks in the margins of each page, often marking a section containing a problem (e.g., grammar errors or inaccurate content) without any additional explanation. After my initial reading and marking of the paper, I again reviewed the paper, pausing at each marked passage to record my reactions using the voice memo feature of the iPod. Upon reaching the end of the paper, I dictated a brief summary of the strengths and weaknesses of the assignment. Each voice recording lasted approximately 3-5 minutes.

Measures: Following the provision of the iPod feedback, a paper-and-pencil student feedback questionnaire was administered. The questionnaire comprised five closed-ended and two open-ended questions related to student satisfaction with the iPod feedback.

Outcome: Overall, the students reported liking the iPod feedback (90% agree/strongly agree), though fewer reported liking it more than the previous method of written feedback alone (69% agree/strongly agree). (The students had completed three papers and received written feedback prior to the paper for which iPod feedback was provided.) Moreover, students indicated that they would like the instructor to continue providing iPod feedback

(88% agree/strongly agree) and would like their other instructors to provide iPod feedback (78% agree/strongly agree). Students indicated that they preferred the audio feedback because it was more detailed, the tone of voice of the professor helped to emphasize which sections to work on the most, and there were no problems with reading the professor's shorthand.

Qualitatively I found that recording comments in audio format allowed me to give more detailed feedback. While it initially took longer, eventually time used per paper was about equal for written or audio feedback. I enjoyed the audio feedback more because I felt like I was getting the message across better to the students. Overall I am very pleased with this use of the iPod and microphone and plan to continue to use it in future classes.

However, several limitations should be noted. First, and potentially most problematic, using the "High Quality" voice memo setting on the iPod results in large files. Even recordings as short as five minutes can require that the file be separated into two or more smaller files before being sent via e-mail. A potential solution would be to use a web-based file-hosting service such as <http://www.mediafire.com/> to provide access to the feedback, or to use the "Low Quality" setting, which did not noticeably decrease the sound quality. Also, recording as the battery charge wanes can degrade the quality of the data file, sometimes resulting in corrupted files that cannot be played. Finally, recording dictated comments requires a quiet environment in which to grade papers, whereas written comments allow grading in more diverse environments.

Faculty #4

Challenge 1: Writing conferences with students (graduate and undergraduate). When meeting with students to provide feedback on their papers, students often fail to take notes on the verbal feedback provided to them, or have difficulty actively attending to the instructor's feedback and taking notes simultaneously.

Solution: I used the iPod to record my verbal feedback to each freshman student during an individual meeting with me regarding the final paper draft. I also used the iPod to record my feedback to graduate students regarding their final paper drafts during my individual meetings with them.

Measures: Following the provision of the iPod feedback, a paper-and-pencil student feedback questionnaire was administered. The questionnaire comprised five closed-ended and two open-ended questions related to student satisfaction with the iPod feedback.

Outcome: Because the responses to the recorded meetings were quite disparate between the graduate students ($n = 3$) and the freshmen ($n = 6$), the data are presented separately. Overall, the freshmen liked having a podcast of their individual feedback meetings. All six "agreed" or "strongly agreed" that they "liked getting feedback in the form of a podcast." Five of the six "agreed" or "strongly agreed" that they "liked getting feedback in the form of a podcast MORE than the previous method" (of meeting without recording) and that they "would like the instructor to use podcast feedback again." All six "agreed"

or “strongly agreed: that “the podcast feedback helped me to improve on my next assignment.” These meetings were 7-10 minutes long, and many of the students’ comments suggested they liked the podcast because it allowed them to listen more carefully to the feedback without also trying to take notes, and then they were able to go back and listen to the feedback again, taking notes on the podcast. Graduate student meetings were longer – 15-25 minutes – which may be why 2 of the 3 “disagreed” or “strongly disagreed” with the above statements – and 2 of the 3 did not wish to receive podcast feedback in the future. One thought this method was useful stating “I can’t always remember verbal suggestions, but now I can go back and listen to them on the podcast” and all three commented that the sound quality needs improving and it took too long to download the file.

Challenge 2: Student presentations. Students rarely have a chance to hear themselves as they give a presentation, making it more difficult to learn to improve upon their public speaking skills.

Solution: I used the iPod to record students’ 90-second practice presentations. Students gave 90-second presentations in preparation for their final 5-minute presentations. The rest of the class brought in “noisemakers” that they used each time the presenting student used a filler word (e.g., “um”, “uh”, “like”, “you know”). Thus, students had the opportunity to practice with little grade penalty. However, students rarely have the opportunity to go back and listen to their presentations again, which would presumably improve their presentation skills.

Measures: Same as for Problem 1.

Outcome: Eleven of 20 students answered the questionnaire. Nearly all (82%) “agreed” or “strongly agreed” that: they liked getting feedback in the form of a podcast, 91% “agreed” or “strongly agreed” that the podcast feedback helped to improve their next assignment, and just over half (55%) wanted to receive podcast feedback in other classes. Comments about what students liked most about the podcast feedback included, “it gave me a chance to listen to myself so I could improve;” useful as a guide for my final presentation because I could listen to it over and over;” “I could hear what was wrong and needed improving.” Some students commented that they did not like hearing their voices, but thought it was a useful exercise nonetheless. Finally some commented on the length of time it took to upload the podcast and the poor sound quality.

After using the iPod, I discovered several limitations, although none outweighed the benefits. First, the iPod microphone is not as powerful as I had initially thought due to low volume and sound quality. Second, sending podcast files to each individual student proved to be quite time-consuming and cumbersome. The use of a website that hosts the podcasts did alleviate this difficulty to some degree (<http://www.mediafire.com/>), making it easier to email each student his or her podcast.

Beyond the Psychology Faculty Cohort

Additional, other faculty participated from various departments and although similar extension outcomes-base data were not gathered, we will present the faculty members department and the initiatives which they implemented their iPods in teaching and learning. The hope is that readers from many disciplines can read the details from the psychology department as well as the ideas from other disciplines and be able to generalize into their teaching.

Economics: Interview specialists on topics that are discussed in class and link voiceovers to PowerPoint slides for students.

Physical Therapy: Create audio for podcasting on each movement of the body and make available on an interactive syllabus for students to download, review and apply. Create vodcast on similar movements of the body. Record patient interviews in the community that are used as case studies.

Theatre Arts: Recording audio files covering the in-class warm up exercises for Acting (guided meditation/concentration exercises, stretching/muscle release exercises, vocal warm-up exercises).

History: Recording class lectures to assist students who panic when they hear a foreign term in a non-language class. Recording a list of new terms, so students can hear the pronunciation.

Sport Science: Create guided vodcast and an SPSS guide talking students through the steps of entering data and calculating the statistics.

Education: Students learn to administer reading, writing, spelling and math assessments, and then perform practice exercises in class using video. The exercises will be recorded as the instructor provides assessment which can be played back on the iPods.

Discussion

Initial Interaction – Faculty Meets iPod

Frequently, faculty members differ on their perspective on using instructional technology, however, when the iPods were offered, many of them expressed an interest. The iPod provided a different sense of using technology, as most people were familiar with recording audio, so this tool simply enhanced this ability, as well as increased its portability, hence usability, especially in teaching and learning. Although faculty members initially did not know how the iPod functioned, this was remedied with little effort. The main challenge, which faculty was most suited for was to create innovative ideas for using the iPod to enhance their teaching and learning. In the beginning, there was some apprehension, however once a few ideas were generated, everyone could quickly trans-

late the ideas into their own discipline. The more difficult hurdle was finding the time to implement the innovative methods.

Time, Time, Time – There will never be enough

The intent of the iPod was never to save time, as is the case in using most technology learning tools, but to add power and offer diverse learning environments which attend to learning styles. Although it seems we never have enough time, faculty on this initiative embraced taking the extra time to improve their teaching and learning, especially in providing additional opportunities for students to interact with the material in alternate ways. This philosophy and subsequent approach resulted in numerous student success stories, which made any additional time and sacrifice worth the investment.

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